

A pack-bonded, multiphase composite material is provided. The multiphase composite material has at least two layers of a matrix material pack-bonded with at least one layer of a reinforcement material. The reinforcement material is oriented in a pack-bonded direction such that the reinforcement material is uniformly dispersed between the matrix materials. Additionally, the matrix materials and the reinforcement material are chemically dissimilar. The matrix material is selected from the group consisting of lead and lead alloys, and the reinforcement material is a plurality of non-conductive, large length-to-diameter ratio, low-density fibers.